

Advanced Algebra II Ch3 Test (80pts)

Name: Key

Date: _____ Pd: _____

1. Match each system to the graph by drawing a line, then label each graph by circling the proper name(6)

$$\begin{cases} 3x + 2y = 8 \\ y = 4 - \frac{3}{2}x \end{cases}$$

$$\begin{cases} 3x + 2y = 4 \\ y = -\frac{3}{2}x + 4 \end{cases}$$

$$\begin{cases} 3x + 2y = 8 \\ y = \frac{3}{2}x - 4 \end{cases}$$

Dependent/Independent/Inconsistent

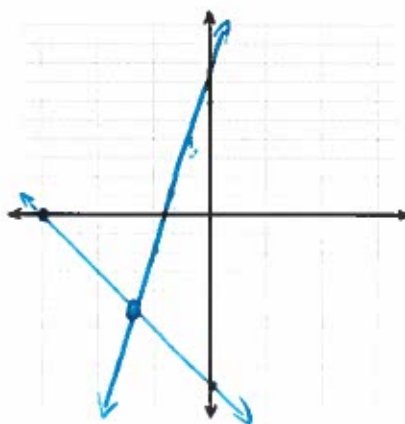
Dependent/Independent/Inconsistent

Dependent/Independent/Inconsistent

2. Solve this system by graphing(5):

$$\begin{cases} x + y = -9 \\ y = 3x + 7 \end{cases}$$

Solution: $(-4, -5)$



3. Solve this system(5): $(7, 5)$

$$\begin{cases} 4x + 5y = 53 \\ 7x + 2y = 59 \end{cases}$$

$$\begin{aligned} 4(7) + 5y &= 53 \\ 28 + 5y &= 53 \\ 5y &= 25 \\ y &= 5 \end{aligned}$$

$$\begin{aligned} 8x + 10y &= 106 \\ -35x - 10y &= -295 \\ \hline -27x &= -189 \\ x &= 7 \end{aligned}$$

4. Solve this system(5): $(-15, -30)$

$$\begin{cases} 5x - 2y = -15 \\ y = 3x + 15 \end{cases}$$

$$\begin{aligned} 5x - 2(3x + 15) &= -15 \\ 5x - 6x - 30 &= -15 \\ -x - 30 &= -15 \\ -x &= 15 \\ x &= -15 \end{aligned}$$

$$\begin{aligned} y &= 3(-15) + 15 \\ y &= -45 + 15 \\ y &= -30 \end{aligned}$$

5. Circle the point(s) that are solutions to this system of inequalities(6): $\begin{cases} y > 2x - 1 \\ y \leq -3x + 9 \end{cases}$

(1, 2) ~~(2, 4)~~ ~~(2, 3)~~ (0, 1) ~~(4, 3)~~

6. Write a system of inequalities for the graph shown(5):

Hint: x-int = 6 and y-int = -4

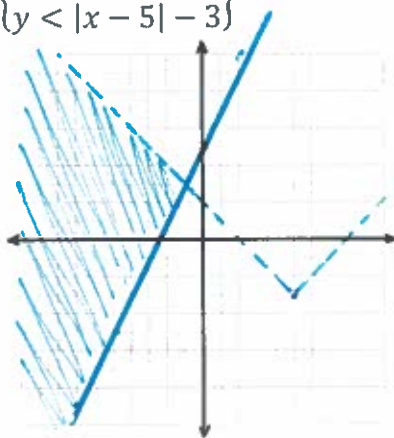
$$y \geq \frac{2}{3}x - 4$$

$$x \geq 0$$

$$y \leq 0$$

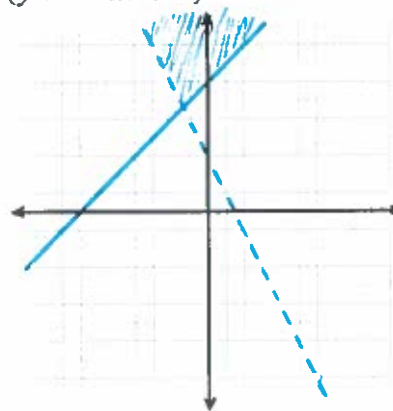
7. Graph this system of inequalities(5):

$$\begin{cases} y \geq 2x + 5 \\ y < |x - 5| - 3 \end{cases}$$



8. Graph this system of inequalities(4):

$$\begin{cases} y \geq x + 7 \\ y > -2x + 3 \end{cases}$$



9. Solve this system of equations(6):

$$\begin{cases} -x - y + z = -4 \\ y = 2x \\ 3x + y - 4z = -5 \end{cases} \rightarrow \begin{cases} -4x - 4y + 4z = -16 \\ 3x + y - 4z = -5 \end{cases}$$

$$(3, 6, 5)$$

$$-x - 3y = -21$$

$$-x - 3(2x) = -21$$

$$-7x = -21$$

$$x = 3$$

$$y = 2(3)$$

$$y = 6$$

$$-3 - 6 + z = -4$$

$$-9 + z = -4$$

$$z = 5$$

10. A 10-lb mixture of peanuts, cashews and raisins sells for \$14. Peanuts cost \$1 per pound, cashews cost \$2 per pound, and raisins cost \$1.50 per pound. The weight of peanuts in the mixture is twice the weight of cashews in the mixture. How many pounds of **each** ingredient is in the mixture(8)?

$p = \text{lbs of peanuts}$
 $c = \text{lbs of cashews}$
 $r = \text{lbs of Raisins}$

$$\begin{aligned}
 3(p + c + r &= 10) \\
 2(p + 2c + 1.5r &= 14)
 \end{aligned}$$

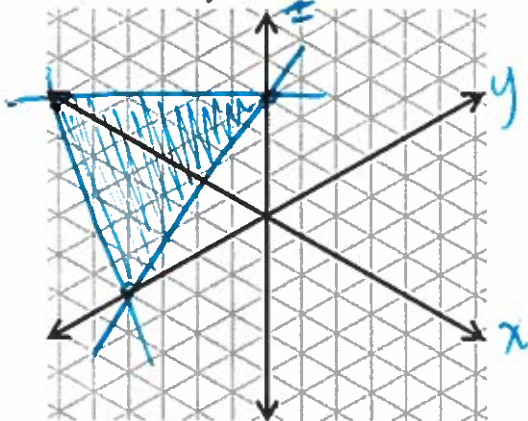
$$\begin{aligned}
 2p + 4c + 3r &= 28 \\
 -3p + 3c + 1.5r &= -30 \\
 -p + c &= -2 \\
 -2c + c &= -2 \\
 -c &= -2 \\
 c &= 2 \\
 p &= 2c \\
 p &= 4 \\
 r &= 4
 \end{aligned}$$

11. (4) What are the x , y , and z -intercepts of the plane with the equation $x + 2y - z = 6$

$x\text{-int} = 6$
 $y\text{-int} = 3$
 $z\text{-int} = -6$

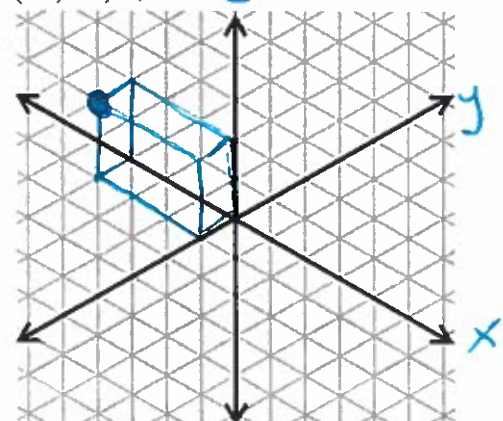
12. Graph the equation(4)

$$4z - 2x - 3y = 12$$



13. Plot the point(3)

$$(-3, -1, 2)$$



~Bonus~

Solve this system of 4 variables!

$$\begin{aligned}
 w - 2x + 3y + z &= 3 \\
 2w - x - y + z &= 4 \\
 w + 2x - 3y - z &= 1 \\
 3w - x + y - 2z &= -4
 \end{aligned}$$

9) Alternate

$$-x - y + z = -4 \rightarrow -x - (2x) + z = -4 \rightarrow -3x + z = -4$$

$$3x + y - 4z = -5 \rightarrow 3x + (2x) - 4z = -5 \rightarrow 5x - 4z = -5$$

$$\begin{array}{rcl} 4(-3x + z = -4) & \rightarrow & -12x + 4z = -16 \\ 5x - 4z = -5 & \rightarrow & \underline{5x - 4z = -5} \\ \hline -7x & = & -21 \end{array}$$

$$x = 3$$

$$y = 2(3)$$

$$y = 6$$

$$-x - y + z = -4$$

$$-(3) - (6) + z = -4$$

$$-9 + z = -4$$

$$z = 5$$

$$(3, 6, 5)$$

10) Alternate

$$p + c + r = 10 \rightarrow 2c + c + r = 10 \rightarrow 3c + r = 10$$

$$p + 2c + 1.5r = 14 \rightarrow 2c + 2c + 1.5r = 14 \rightarrow 4c + 1.5r = 14$$

$$p = 2c$$

$$3(3c + r = 10) \rightarrow 9c + 3r = 30$$

$$-2(4c + 1.5r = 14) \rightarrow \underline{-8c - 3r = -28}$$

$$c = 2$$

$$p = 2c$$

$$p = 2(2)$$

$$p = 4$$

$$p + c + r = 10$$

$$4 + 2 + r = 10$$

$$r = 4$$